THE AMERICAN GAS-LIGHT JOURNAL AND CHEMICAL REPERTORY

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New England Association of Gas Engineers.

[Concluded from page 104.]

Col. Armington read the following paper prepared by him, on "Spontaneous Combustion of Coal, etc." —illustrated by drawings and tables.

Spontaneous Combustion.

A paper read before the late meeting of the New England Association of Gas Engineers, by Colonel J. H. Armington.

During the month of November, 1874, it was discovered that the coal stored in the coal sheds of the Brooklyn Gas-Light Company, Brooklyn, New York, was on fire. It has been the practice for many years at these works to introduce gas-tubing, 1½ inches in diameter, in the various piles of coals, in order that the temperature should be known, and a daily record made of it. In this way a careful watch has been kept, and whenever the temperature changes it has been immediately noticed, and the necessary steps taken to prevent any further danger, by at once using the coal showing the extra heat. The coals purchased by this company during 1874 were supposed to be so free from sulphur and iron, that the tubing was not introduced, and consequently the high temperature was not known, until that peculiar odor was noticed which is always given off when spontaneous combustion occurs in gas coals. At the same time that the peculiar odor was apparent, smoke appeared in the shed, and operations were at once commenced to find the fire. After three days and nights of continuous labor, and the removal of about 900 tons of coal, the fire was discovered to have taken in a pile of Penn coal; and, when reached, it proved to be confined to a space of less than 12 feet in diameter, and 4 feet in height. This entire mass was so thoroughly baked together that it had to be broken in pieces with bars in order to remove it. After removing it from the shed, it was piled in a heap on the wharf, and in a few minutes after being exposed to the air, the whole mass was in a blaze. Only two instances of this kind have ever come to the knowledge of the writer—of spontaneous combustion in our domestic coals—and I believe it is the general opinion of gas engineers, that no danger is to be apprehended from stowing these coals in piles of the ordinary height that we are accustomed to see about the gas works in this country.

The first instance of this kind which came to my knowledge, occurred in Troy, N. Y, and the cause was said to have been from its being so solidly packed, the fire having taken place directly underneath the dumping hatch of the coal shed. The other was in the works of the New York Gas Company, and the cause of this fire I have never heard stated. It will be seen from the drawings, showing the position of the fire in the sheds of the Brooklyn Gas Company, that the fire commenced between the tracks, and in that portion of the coal which rolled from the piles where it was dumped, on each side of it; it must, therefore, be evident to us all that this fire could not have occured from the same cause as that mentioned in the coal sheds at Troy.

From whatever cause the fire did proceed (and in this case I am unable to give any satisfactory reason for it) it shows us that there is danger of spontaneous combustion in our coal stores and that the necessary precautions should always be taken to discover any overheating which may be likely to occur. Having been asked how the pipes are prepared in which the thermometers are inserted, I will state—that in one end of a pipe a solid-pointed-plug is welded, to close the end, and to better adapt the pipe for being driven down through the coal; above this plug a dozen or more holes, one-half inch in diameter, are then drilled, giving the necessary opening for the air to enter,

The temperatures, which are regularly taken, vary from day to day, and are always found to be higher than the temperature of the atmosphere. By an examination of the tables of temperatures accompanying this report, it will be seen that this variation is very great, and proceeds from some cause which is well worthy of our examination. During the past week it was discovered that the temperature was rising in a pile of Newcastle coal, and when the thermometer indicated 200°, men were set at work to turn the coal over, and the fire was soon found in one of the spruce uprights which supported the trestle-work of the track from which the coal was dumped.

This coal had been piled about seven months, and the fire was directly under the track from which the coal was dumped.

The fire was confined to a space about 8 inches in diameter, and had not, so far as could be discovered, affected the coal except by disintegration. It will be noticed in this case that the heat was sufficient to ignite the wood, and, had it not been discovered, the burning of the wood would have soon ignited the coal.

The highest temperature that had been noticed in this pile of coal, previous to the discovery of the fire, was 120°; and, while the coal was being removed, another thermometer, within ten feet of the one indicating 200°, only indicated 118°

There are many interesting facts connected with our business which if carefully observed, would be of value to us; and it is to be hoped that, notwithstanding the many valuable points said to have been discovered, and successfully applied, by our friends in the naphtha line, that our attention will, in some measure, still be directed not only to the purchase of the best coals, but to the care and preservation of them while in our stores.

Voted—That the thanks of the Association be tendered to Colonel Armington for his valuable and interesting paper.

The Secretary introduced the subject of the manufacture and distribution of petroleum or naphtha gas, by reading an interesting and able communication to him from J. Desha Patton, Esq., Gas Engineer, of Trevorton, Pennsylvania.

The reading of the paper led to a long discussion, which was participated in by a large portion of the members, and also by Messrs. White, Balmore, Nettleton and others who were present by invitation. Much interest was manifested in the consideration of the subject, and valuable information was imparted by those who had adopted, in part, the manufacture of naphtha gas. Considerable time having been devoted to this topic, and it being near the hour for adjournment, it was voted that the discussion be closed.

Mr. Greenough in behalf of the Boston Gas-Light Company extended an invitation to those present to visit the works of that Company on the following day, at such hour as should be agreeable to them. Voted that the invitation be accepted.

The committee appointed to select a place for holding the next semi-annual meeting reported, two in favor of Portsmouth, N. H., and one in favor of Providence, R. I.

Voted—To accept the report of the committee, and that Providence, R. I., be the place for holding said meeting.

Messrs. Slater of Providence, Stiness of Pawtucket, and Neal of Boston, were appointed a committee to make the necessary arrangements for the meeting.

Voted—That the directors be authorized in behalf of the Association to invite to be present, at any meeting of the Association, any gas engineers in good standing, residing out of the New England States.

The "Use of Coal-tar as Fuel in the Carbonization of Coal," was the next topic discussed.

Messrs. White, Tarbell, Nettleton, Coggshall and others, gave the results of their experience it its use at the respective works under their charge.

From the fact that coal tar is now almost a "drug upon the market," the statements relative to its use as fuel in gas works were listened to with marked attention; and the comparatively brief consideration of the subject, whereby much valuable information was elicited, will no doubt result in good to the several gas companies represented.

Mr. Nettleton, as Secretary of the American Gas-Light Association, gave notice of the next semi-annual meeting of that Association, to be held in Washington, D. C., in the month of May next, and extended a pressing invitation to all those present to attend the meeting; and, if they have not already done so, to enroll their names on its list of members. Voted to

adjourn, to meet at ten o'clock to-morrow (Friday) morning.

At six o'clock in the evening a large number of the members of the Association, with their invited guests, sat down to an excellent dinner prepared for them, in the "Ladies' Ordinary" of the Tremont House. Mr. Cabot, the newly-elected President, occupied the head of the table, with Mr. Greenough, the retiring President, as his right hand man. About two hours were spent in a very pleasant manner, both in physical and mental recreation. Remarks were made by many of the members, and by nearly all the guests who were called upon to say something. The occasion was a very happy one, and will tend to promote good feeling and a better acquaintance among the members of the Association; and will strengthen the ties of friendship between them and their brethren of the same profession residing out of the New England States.

The Association met at 10 o'clock on Friday morning, according to adjournment.

Several members had been obliged to leave on the previous evening, but there were thirty-two persons present.

The President having taken the chair, it was voted that the reading of the records be dispensed with.

The following topics were then taken up in succession and were considered at more or less length, viz. —"The necessity or expediency of the use of valves on street mains"; nuisances arising from the manufacture of gas"; "loss of gas by leakage"; "injury to persons and property by leakage and and by explosions of gas"; "spontaneous combustion of coal" and "naphthaline in mains and service pipes."

A description of the "Elmer Process," for making gas from coal, was given by a member, with an account of a visit made by him to the gas works at Yonkers, New York, where that process is in operation. This led to quite an interesting discussion upon the merits of this method, as well as of several others said to be based upon the same principles.

The consideration of these topics having occupied as much of the closing hours of the session as could be allowed, it was voted that all further discussion or debate be closed, preparatory to final adjournment.

Voted—That the thanks of the Association be tendered to those gentlemen who, upon invitation, have favored us with their presence; and that we extend to them, in parting, our best wishes for their future welfare and happiness.

Voted—That the next semi-annual meeting be held in Providence, as already designated, on the third Wednesday of August next, at 12 o'clock, noon.

The Association then adjourned *sine die*.

Soon after the close of the meeting of the Association, a large number of the members and invited guests, in response to the invitation extended to them on the previous day, by Mr. Greenough, visited the works of the Boston Gas-Light Company. Upon their arrival there, they were very kindly received by Malcolm S. Greenough, Esq., the "General Assistant" of the Company, and Charles D. Lamson, Esq., the Superintendent of the works, and were escorted by them through the premises.

Order and neatness seemed to pervade the whole establishment, and the varied and complicated machinery and apparatus required for use in works of the size and capacity of these, appeared to be constructed and arranged in a thoroughly complete and systematic manner.

Particular attention was directed to the very convenient and useful mechanical and electrical apparatus for signals, from the superintendent's office to any part of the works, and to the general office; the instruments for receiving and recording the height of the distant holders of the company; the various gauges, tests and other appliances, intended to indicate the condition of things at a glance; and a complete "experimental works."

As these and many other objects of interest passed under the observation of the visitors, remarks were made highly complimentary to the efficiency and ability of the superintendent in charge, and reflecting credit upon the engineering skill and talent of the manager of the company.

Upon leaving, the visitors expressed themselves well pleased with the excellent condition of the works, and highly gratified with their reception and the attentions shown them.

Soon after this visit many of the party returned to their homes; a few, however, remained another day, and occupied the time in visiting other gas works and places of interest in the city and vicinity.

In the opinion of the writer, and many others who have spoken to him on the subject, the meeting just held (a brief abstract of which has been given above) was the most interesting and profitable of all the meetings which have heretofore been held by the Association.

The organization now numbers over sixty gas engineers from all parts of the New England States—many of them eminent in their profession—and all of them deeply imbued, we hope, with a high sense of the responsible position which they hold, both as relates to the stockholders of the company which they represent, and the community which they serve.

If the Association adheres strictly to the principles upon which it was founded, as it was counselled to do by its retiring President in his closing address, and if its members are true and faithful to it, and suffer no abatement of their personalinterest in its welfare and success, there would seem to be nothing to prevent its assuming, and maintaining, a prominent and influential position among Associations of a like kind in this and other countries, and conferring real and lasting benefit upon both the manufacturer and the consumer of illuminating gas, which, as an article of consumption, is now regarded very generally, not merely as a luxury, but, to a considerable extent, as a necessity.

GEO. B. NEAL,
Secretary of the Association.

BOSTON, March 5th, 1875.

PREAMBLE AND ARTICLES OF AGREEMENT OF THE NEW ENGLAND ASSOCIATION OF GAS ENGINEERS.

Preamble.—Whereas, the manufacture and supply of gas has become one of the largest economic interests of the country; and, whereas, it is most important to the manufacturers and to the public that the best processes known shall be employed in its manufacture and distribution; and, whereas, it is most desirable to obtain the advantage of the experience of the gas engineers scattered throughout New England upon the various problems presented for consideration—We, the undersigned, hereby agree to associate ourselves for the above-named purpose, according to the following

ARTICLES OF AGREEMENT.

1. The association shall be called "The New England Association of Gas Engineers."

2. The annual meetings of the Association shall be held on the third Wednesday of February in each year, at such hour and place as the Directors shall determine.

3. The officers of the Association shall be a President, two Vice-Presidents, a Secretary and Treasurer, who, with five other members of the Association, elected for the purpose, shall constitute a Board of Directors.

4. Any New England gas engineer may become a member upon application to the Board of Directors

1873	Date.	Domestic coals.	Atmosphere.	1873	Date.	Domestic coals.	Atmosphere.	Newburgh outside.	1873	Date.	Domestic coals.	Atmosphere.	Province outside.	1874	Date.	Domestic coals	Atmosphere.	1874	Date.	Domestic coals	Newcastle.	Atmosphere.	1874	Date.	Domestic coals.	Newcastle.	Atmosphere
July	3	84	84	August.	1	95	78		Sept.	1	101	74		Jan.	2	76	42	Nov.	5	74	122	45	Dec.	1	69	112	23
"	5	85	78	"	2	93	79		"	2	98	70		"	3	76	38	"	6	90	126	51	"	2	69	114	32
"	7	87	68	"	4	95	74		"	3	98	73		"	4	76	50	"	7	93	129	49	"	3	69	113	42
"	8	87	70	"	5	93	70		"	4	98	75		"	5	76	44	"	12	91	126	38	"	4	69	112	42
"	9	89	72	"	6	92	74		"	5	98	78	148	"	6	76	35	"	13	91	121	31	"	5	69	112	27
"	10	90	75	"	7	91	74		"	6	98	68	148	"	7	76	55	"	14	91	121	25	"	6	69	111	35
"	11	89	68	"	8	92	76		"	8	100	60	148	"	8	76	52	"	16	92	116	38	"	7	68	120	40
"	12	89	68	"	9	91	75		"	9	100	64	148	"	9	76	32	"	17	88	115	44	"	8	68	110	39
"	14	93	76	"	11	93	70		"	10	99	60	146	"	10	76	38	"	18	87	116	54	"	9	68	110	29
"	15	93	78	"	12	93	72		"	11	99	60	148	"	11	76	35	"	19	86	118	34	"	10	66	108	37
"	16	93	76	"	13	93	65		"	12	99	64	148	"	12	74	30	"	20	87	119	38	"	11	67	107	36
"	17	93	74	"	14	95	64		"	13	99	65	148	"	13	64	26	"	21	84	116	42	"	12	67	108	30
"	18	93	70	"	15	95	65	114	"	14	98	48	148	"	14	66	30	"	23	84	114	43	"	14	63	112	44
"	19	93	65	"	16	95	72	114	"	15	98	48	144	"	15	66	22	"	24	85	117	53	"	15	66	112	15
"	21	93	68	"	18	95	66	114	"	16	98	60	140	"	16	64	15	"	25	84	115	40	"	16	66	107	17
"	22	92	72	"	19	95	70	112	"	18	98	55	140	"	17	64	18	"	26	84	115	27	"	17	64	105	36
"	23	92	74	"	20	95	70		"	19	98	60	140					"	27	81	114	29	"	18	65	105	26
"	24	93	78	"	21	95	70		"	20	98	62	140					"	28	73	114	38	"	19	64	106	34
"	25	93	82	"	22	95	75		"	22	98	52	138					"	29	70	112	35	"	21	63	107	26
"	26	93	82	"	23	95	77		"	23	98	55	132					"	30	69	114	25	"	22	62	105	26
"	28	93	78	"	25	93	60	124	"	24	98	60	132										"	23	60	109	28
"	29	93	78	"	26	101	68		"	25	98	64	132										"	24	60	107	35
"	30	93	78	"	27	102	68		"	26	98	64	132														
"	31	93	78	"	28	102	65		"	27	98	64	132														
				"	29	101	66		"	28	98	68	132														
				"	30	102	65	88	"	29	98	70	132														
									"	30	98	60	132														

and an election by three-quarters of the votes at any regular meeting of the Association, and by signing an agreement to pay such assessments as may be levied by the Board of Directors. Any gas engineer residing out of the New England States may be elected an Honorary member by the same vote as is required for the election of regular members of the Association.

5. The administration of its affairs shall be entrusted to the officers of the institution, of whom four shall form a quorum for the transaction of business.

6. The Secretary and Treasurer shall receive all moneys; he shall also notify all meetings, taking minutes of the proceedings at all meetings of the Association, and enter them in proper books provided for the purpose. He shall write the correspondence, read minutes and notices at all the meetings, and also papers and communications, if the authors wish it; report discussions, and perform whatever other duties may be indicated in the regulations of the Association as appertaining to his department.

7. At any regular meeting of the Association ten members shall be a quorum for the transaction of business.

8. All questions shall be decided by any convenient system of open voting; the chairman to have a second or casting vote when necessary. Questions of a personal nature shall be decided by ballot.

9. All papers read at the meetings of the Association must relate to matters directly or indirectly connected with the manufacture of gas, and must be approved by the Board of Directors before being read.

10. All papers, drawings, or models, submitted to these meetings shall remain the property of the authors.

11. If any person proposed for membership, on being balloted for, shall be rejected, no notice shall be taken of the proposal in the minutes.

12. The annual contributions shall be payable in advance, at or before each general meeting; and no member whose contribution is in arrear shall be entitled to vote.

13. These articles may be altered or amended at any annual meeting, notice of such proposed change having been given at least one fortnight previous to such meeting.

OFFICERS AND MEMBERS OF THE NEW ENGLAND ASSOCIATION OF GAS ENGINEERS FOR 1875-6.

OFFICERS.

President.—George D. Cabot.

Vice-Presidents.—O. E. Cushing, Samuel G. Stiness.

Directors.—John M. Hill, T. Metlar Cox, William A. Stedman, F. C. Sherman, William C. Perry.

Secretary and Treasurer.—Geo. B. Neal.

MDMBERS.

William Yorke	Portland	Maine.
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Charles F. Warren	Manchester	"
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William Badger	Concord	"
A. M. Norton	Nashua	"
C. F. Spaulding	Burlington	Vt.
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George D. Cabot	Lawrence	"
O. E. Cushing	Lowell	"
L. P. Gerould	Newton and Watertown	"
Malcolm S. Greenough	Boston	"
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James Porter	Greenfield	"
George Dwight	Springfield	"
Henry Rice	N. Attleboro'	"
John Andrew	Chelsea	"
William Gibson	Cambridge	"
R. R. Harriman	Lawrence	"
Aaron Thompson	Woburn	"
F. C. Sherman	Worcester	"
Geo. B. Neal	Charlestown	"
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H. F. Coggshall	Fitchburg	"
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David W. Crafts	Northampton	"
Horace A. Allyn	Brookline	"
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William C. Taber	New Bedford	"
William B. Durfee	Fall River	"
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Gideon Wood	New Bedford	"
J. T. Baylies	Malden	"
Charles F. Smith	Marlboro'	"
David Brayton	Brocton	"
Dudley T. Tilton	Newburyport	"
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C. W. Cochrane	Gloucester	"
*James H. Armington	Providence	R. I.
Samuel G. Stiness	Pawtucket	"
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W. A. Stedman	Newport	"
A. B. Slater	Providence	"
Charles H. Porter	Providence	"
William J. Miller	Bristol	"
J. P. Harbison	Hartford	Conn.
J. A. Hadley	Meriden	"
L. C, Handford	Norwalk	"
Everett C. Learned	New Britain	"
T. Metlar Cox	New Haven	"
H. B. Field	Waterbury	"
Charles A. Gerdenier	Bridgeport	"
Ogden Gilmor	Norwich	"
Charles H. Nettleton	Derby	"

* Now of Brooklyn Gas-Light Company, N. Y.

Petroleum in West Virginia.

This product, up to this time, is only found in a belt of upheaved or dislocated territory, commonly styled "the Break," from one to two miles wide, and extending in a direction north 10° east over a distance of 30 miles, from the Little Kanawha river at the mouth of Burning Springs river, to the mouth of French creek on the Ohio river, two miles below the town of St. Mary, and through the counties of Wirt, Wood, Ritchie and Pleasants. It embraces the famous centers of production:

Rathbone's Burning Springs, Oil Rock, Standing Stone and California, all of which are tributary to the Little Kanawha river, and dependent upon it for transportation to markets. At several of these points a number of wells were formerly developed, flowing or pumping 50 to 200 barrels per day for many months in succession. Notwithstanding these encouraging yields, but a comparatively small portion of the belt has been thoroughly tested, owing, first, to the want of reliable transportation, now obviated by the lock and dam improvement, and latterly on account of the falling off in price and demand. Under more favorable circumstances, the development of oil will assume unprecedented proportions, especially since a scientific mapping of the "Break" has facilitated the location of progressive wells with a degree of certainty not attainable in the oil regions of Pennsylvania.

The depth of wells in this section varies from 500 to 1,000 feet, the gravity diminishing with the increase of depth. The number of wells worked at Burning Springs has varied from 25 to 50, and the production from 50,000 to 100,000 barrels per annum. The oils of this vicinity are of light grade, varying from 36° to 42° gravity, and are preferred by the refiners to the best Pennsylvania oil. Transportation to Parkersburg in bulk boats costs one cent per gallon, in barrels per barges 50 cents per barrel, to which is now to be added $1.50 per boat load for each lockage. From the wells most distant from the river, oil is conveyed to the boats by metal pipes for a reasonable toll rated per gallon per mile. The price of genuine oil land within the belt, and surrounded by productive wells, ranges from 2,000 to 5,000 per acre, but is now seldom paid, operators preferring to lease at a bonus of 500 to 1,000 per acre, and a royalty of one-eighth to one-third of the production.

Chemical Repertory.

No. 130.—April 2, 1875.

EDITOR—HENRY WURTZ.

CHEMICAL EXCERPTS.

1390. ANILINE IN COAL-TAR OILS.—W. Smith.—The oils known as the light coal-tar oils, varying in specific gravity from 0·9 to 1·0, are those which appear to contain aniline in largest quantity. The oils obtained from the crude benzole are larger in quantity than from the other sources, but contain less aniline.

1391. THE "DENAROUSE RESPIRATOR."—A trial of an interesting nature, of this respirator, took place recently at the Phœnix Gas Works, in Upper Kennington Lane. One of the great gasometers was lowered to its lowest point, the manhole was then opened, and a workman, protected by the Denayrouse respirator, was lowered to the bottom of the two-feet entrance pipe, 40 feet below the bottom of the gasometer. This pipe contained large quantities of naphthaline crystals, and was full of gas and foul air. No one unprovided with protection could have lived there five seconds. The workman remained some time below and was able to converse freely with those above. —*Iron.*

1392. NEW ALARM AND HEATING APPARATUS.—An alarm and heating apparatus, both novel in design and useful in its application, has been patented by Mr. A. Sharp, of Main Street, Bridgeton, Glasgow. It answers the purpose of waking persons who have to go out to work early in the morning, and also that of heating tea, coffee, or other liquid, in a miniature boiler, which is attached to it. The apparatus may be placed on a mantelpiece or any other part of the house, and can be made to arouse the sleeper at any given hour, the operation being performed by means of a wire attached to one of the weights of a clock, regulated by an index. In the course of two minutes after touching the wire, the boiler commences to whistle, and this continues until some person turns it off. It is necessary, however, to keep a very small gas jet burning all night, which, by means of an atmospheric tube, communicates with and heats the tea or coffee in the small boiler referred to. The expense of the gas used will not exceed 1*d.* per week, and it is entirely free from smoke.—*British Mail.*

1393. THE TELEGRAPH WIRES.—Some statements of Dr. Van der Weyde, in his Journal, the *Manufacturer* and *Builder*, are of interest in connection with the underground-wire movement. He tells us that the wire in use by the city police and fire-alarm telegraphs consists of steel and copper, was erected by contract, and cost the city the exorbitant sum of $850,000 for only 625 miles of wire, which is at the rate of $1,360 per mile. The Western Union Telegraph Company uses an ordinary galvanized wire that cost it scarcely $50 per mile. The heavy snow storm of December 20 last broke the city wires in every direction, and in such a way that they were an utter wreck, and the telegraph services of the Police and Fire departments were totally suspended until repairs were accomplished. At the same time the wires of the Western Union suffered little or no damage. In other words, the city was swindled with worthless telegraph wire at a cost twenty-six hundred times greater than that by which a private corporation furnished itself with a serviceable article.

1394. ENERGY OF EXPLOSIVES.—In comparing the motive energy of various simple and compound bodies, we find coal is left far behind when the effective energy of equal weights of the various substances are taken.

Explosive substances, as a rule, contain an infinitely larger amount of potential energy than coal, taken weight for weight. Powder when exploded will

develop from 600 to 300 times the power of the same weight of coal. Dynamite, gun-cotton, and picrate of potash give considerably higher results, but nitro-glycerine gives the most astounding evolution of force. A litre of nitro-glycerine weighs 1·6 kilogs. If this body explodes in a space equal to its own volume it will develop a pressure of 470,000 atmospheres —six to ten times that of powder. The heat developed would be about 38,000,000 of units, which at the rate of 420 kilos. per unit would produce a force of nearly sixteen milliards of kilogrammetres (16,000,000,000) or 3000 *times that of an equal weight of coal.* As a more likely fact to be easily grasped by mechanical readers, we may state that in a single litre of nitro-glycerine (1·6 kilogs.) is contained the enormous amount of 5,500 indicated horse-power operating for a space of ten hours.—*Iron.*

1395. Growth of Fungi on Board Ship.—A few weeks ago the "Lord Clyde," armor-plated ship, being in dock at Keyham, efforts were made to stop the growth of fungi on board. Holes of different sizes were bored in various parts of her hull, and carbolic acid was injected in these places freely, with the view of eradicating the fungi. She was undocked and placed in the harbor, fires were lighted and kept burning in various parts of the ship, raising the temperature to above 120° on an average. Some very fine specimens of fungi have been produced from the ship, but it was hoped that the means taken would have subdued the growth. This effect was indeed caused while the temperature was kept up, but within the last few days the fires have been put out and the vessel has been taken into Keyham Basin. She is now to be opened in several places by cutting holes through the side for the purpose of ventilation, but since the temperature has been reduced to its normal heat fungi are again making their appearance, and can be seen through the test holes. The new growth is easily distinguished from that which previously existed.

1396. Known Anaesthetics.—Most people know of but three or four anaesthetic agents, *ether, chloroform, laughing-gas,* and we may add *alcohol.* The eminent Dr. Richardson, of London, who has made a special study of anaesthetics, indicates also the following, as capable of producing different kinds of anaesthetic insensibility:

Carbonic oxide gas; carbonic acid gas; bisulphide of carbon; light carburetted hydrogen; hydride of methyle or marsh gas; methylic alcohol; methylic ether gas: *bichloride of methylene;* tetra-chloride of carbon; heavy carburetted hydrogen gas; *olefiant gas or ethylene; chloride of ethyle; bichloride of ethylene* (Dutch liquid); *bromide of ethyle, or hydrobomic ethee;* hydride of amyle; amylene; benzole; turpentine spirit.

Gas Items.

Balloonacy.—It is stated that Donaldson is to have $40,000, from certain parties named, for constructing a balloon and defraying the expenses incidental to a transatlantic balloon voyage to Europe, to be made by him between October 1st and November 15th of the present year. It has been further stipulated that Donaldson shall receive $10,000 in case he shall make the voyage in 72 hours, or $20,000 if he shall make it in 48 hours. The agreement was signed in this city last month.

[Balloons, if there were only enough of them, would be good for the gas companies; but we fear that they will never affect gas stocks, in our time at least.—Ed.]

Gas-Coal Freights.—Baltimore and Ohio Railroad February's special rate of freight on gas coal from Fairmount, Clarksburg and neighborhood, to Locust Point and Baltimore, for shipment east and south of capes of Virginia, $5 per ton of 2000 lbs. Drawback $1.55.—*Coal Trade Journal.*

The Delaware Ice-Gorge.—The effect of the breaking up of this on the gas works at Port Jervis, is thus stated:

"The gas works near the bridge were built in 1861 by the Gas Producers' Company at a cost of $25,000. The bench of seven gas retorts was flooded when the fires were in full blast, and it probably received a loss of $8,900, but beyond this no damage was done."

Natural Gas at Pittsburgh.—The *Commercial* says: A project is on foot for supplying this city with gas from the Vandegrift well in Butler county, to supply the place of coal in our manufactories. Engineer Davis was applied to recently for calculations regarding the cost, etc., and it is not improbable that ere long the immense quantity of gas now going to waste at this wonderful well will be utilized in such a way as to save a heavy expense to many of our people

Jersey City Street-Lamps.—The Jersey City *Journal* bitterly complains that no city in the United States pays so high a price for lighting its streets. To quote?

"We are paying $63 per lamp for gas-light New York pays $38 and $45; Newark about the same rate; many cities are lighted at a cost of $30 lamp. The exorbitant price paid is in consequence of a long contract with the gas companies, which, it is claimed, cannot be revoked."

[Philadelphia, as we have before stated, pays $55.35 per lamp, but even this is not "a circumstance" to Jersey City, unless the *Journal* is wrong in its figures.—Ed.]

More Jersey City.—At a meeting of the Jersey City Police Commissioners March 22, one of them, Mr. Edmondson, stated that "the gas companies have offered to reduce the bills of the county 25 per cent., if the county will pay its bills, and the companies can make a similar reduction in favor of the city. Mr. Edmondson then proceeded to make the following exhibit.

"He took from his desk a thin tube which by accident he had discovered on a street lamp. It was a three-foot burner complete, with a five-foot burner screwed over the first. This was on a Jersey City Gas Co.'s lamp, whose contract specifies they shall furnish four feet of gas per hour. Mr. Edmondson said that the arrangement he held in his hand looked like a swindle, and he had discovered that there were hundreds of them in the city, and the company is charging for four feet of gas when it only gives three feet. He argued in favor of cutting down the lamps."

Brooklyn.—The Equity Gas Company, operating, we believe, under the process of Dr. Wren, have decided to commence laying their mains in Grand street, E. D., in the opening days of April. This corporation was chartered by the Legislature of 1874 to supply the Eastern District with gas at $2 per thousand cubic feet. The gas is to be manufactured from crude petroleum. Ex-Assemblyman Cochen is the President of the new company.

Malodorous.—Very bad gas *leaked* out, to an unprecedented extent, lately, in the New Jersey Legislature; culminating indeed in what may be called a gas-explosion, sprung upon that "gay and festive scene." We have referred to a bill introduced for a new company for Union Hill, etc. We gather as follows: Mr. W. B. Lundie, of Union Hill, connected, we believe, with the Metropolitan Gas-Light Co. of this city, swore that one Cosgrove, who is something-or-other political, in New Jersey, tried to "blackmail" him, on behalf of two gentlemen of the legislative committee in charge. Could we spare space for the correspondence in the case, we might furnish amusement to our readers; but amusement is cheap now-a-days. The two members implicated have been exonerated by a committee of investigation, it would appear, at latest accounts.

Gas-Music.—On February 17th, a paper, descriptive of M. Kastner's new musical instrument, the "Pyrophone," was read to the London Society of Arts. One of the instruments was experimented upon. It was composed of a frame enclosing glass tubes, arranged in the form of the pipes of a small organ. In each of the tubes were two jets of gas, which were made to unite and separate by the action of keys, and thereby produced musical sounds. The paper, after describing the sound of the Pyrophone, proceeded to explain the principles on which the sounds were produced. A very simple mechanism caused each key to communicate with the supply pipes of the flames in the glass tubes. On pressing the keys the flames separated, and the sound was produced. As soon as the fingers were removed from the keys, the flames joined, and the sound ceased immediately. If two flames of suitable size were introduced into a glass tube, and they were so disposed that they reached one-third of the tube's height, measured from the base, the flames would vibrate in unison. This phenomenon continued as long as the flames remained apart, but the sound ceased as soon as the flames were united.

Thawing Holder—Tanks.—A gas man, B. A. P., writes to the Glasgow *Herald*, that during the late winter he "overcame this difficulty by a very simple process, viz., salt, applying it uniformly around the gasholder, and in a very few minutes the ice is completely dissolved."

[This might do, in cases of emergency, when steam could not be had; but we could not recommend its copious or prolonged use. During some of *our* recently-past weather, even the brine thus formed would have frozen solid.—Ed.]

Liverpool, England — Curious Event. — Last Christmas came near being celebrated in Liverpool, in a fashion very different from the generally-adopted mode. The long continued frost had for some time blocked up the railways, and consequently the supply of coal to the gas works was greatly reduced. So great, indeed, was the went of material that the managers of the works suddenly found themselves face to face with a crisis of a very alarming nature, the prospect of a complete failure of the gas supply, and the consequent involving of the town in darkness. This disagreeable and dangerous, and fortunately unprecedented occurrence, was only prevented by the energetic action on the part of the authorities. The railway companies were communicated with, and by dint of great exertion a number of wagons were detached and sent off in hot haste to the gas works, where their contents were speedily converted into gas. The only intimation the public had of the narrow escape from total darkness was a slight diminution of the illuminating power and pressure of the gas.

Street-Lamp Meters.—In some English towns, among them Southampton, meters (charged with dilute glycerine) are attached to a certain proportion of the street lamps, on the "average meter" system. In the place referred to, the town appears to have saved during 1874 somewhere about $8,500 in our currency.

Water-Supply Items.

Montreal.—From Montreal we learn that a new Worthington engine was expected shortly to commence pumping, and to supply 8,000,000 gals. daily. The city will then be supplied by pumps capable of giving 24,000,000 gals. per day, turbine wheels capable of giving 10,000,000 gals. per day, two steam engines capable of giving 6,000,000 gals. per day, and the Worthington engine capable of giving 8,000,000 gals. per day. At present, the daily water-consumption of the city only amounts to about the last named quantity.

College Point, L. I.—The trustees of College Point have appointed Mr. T. F. Martins superintendent of their water works, at an annual salary of $840.

To judge from newspaper reports, New England nearly "dried up" during part of the past winter. For instance; at Brattleboro, Vt., water cost thirty cents a barrel, and at Grafton, N. H., one man asked $500 for the privilege of drawing water from his well.

REPREHENSIBLE.—We are told of an Iowa gentleman who should have been remonstrated with. Analysis detected an unhealthful amount of organic matter in his well, and subsequent inquiry traced the contamination to his reprehensible carelessness in leaving three wives therein after he had drowned them.

A CALIFORNIA ARTESIAN WELL.—The Kentucky artesian well, fifteen miles south of Merced city, in the San Joaquin valley, throws up a volume of water that forms a creek, which runs across the plains ten miles to the San Joaquin river. In summer this stream affords water to 500 head of cattle, and nearly an equal number of sheep. Its cost was only $1000.

NEWARK, N. J.—A new pumping engine at the Newark water works has been successfully connected with the large main, and the city is now provided with an abundant supply of water. The engine has a pumping capacity of 8,000,000 gallons a day.

THE HARD WINTER.—Though history tells us of many severer winters than the last, in Europe—there must have been few, if any, colder ones since our American record commenced. The freezing over of Seneca Lake, N. Y., is cited as an *unprecedented* phenomenon, and Greenwood Lake froze 30 inches thick, beyond any previous thickness on record. The Paterson *Press* says:

"There is a very general cry of complaint against the water company for not having their water pipes sunk lower, beyond the reach of the frost. Whole sections of the city have had their water-supply cut off during the past month because the mains were frozen up. The question is also asked, who will repair the damage done to the streets by the hundreds of holes dug in them the past week, to thaw out the pipes?"

BROOKLYN.—Half the fire hydrants have been frozen—as, in fact in almost every other city.

Feb. 8. "Alderman Strong offered a resolution directing the Board of Works to report the cause of the disagreement between the city and contractors Kingsley and Keeney in relation to the completion of the Hempstead Reservoir, and to furnish copies of the contract and the specifications, which was carried."

March 15. "The proposed bill for the completion of the new reservoir was approved. This bill provides for the issue of $500,000 in bonds to complete the work. Alderman Strong opposed the bill, and characterized it as a job of the Board of City Works, which would take the control of the matter out of the hands of the Common Council. The work, he said, was to be completed in the first place for $1,400,000, and now they come in and ask for half a million more to complete it. He called the act a delusion and a snare."

ORANGE, N. J.—That beautiful collocation of growing towns—which may be called a Bunch of Oranges in New Jersey; chiefly settled by New Yorkers, has good *air*, but probably much bad water. A school at South Orange, called "Seton Hall College," was lately broken up, like the Female College at Burlington, by a typhoid-fever pestilence.

The Orange *Journal* discussing a water-supply, says: "From this point of view it would seem that our true policy is to wait until Newark obtains a supply of pure water from Hopatcong, and then secure our head from that city."

Insufficiency of the Croton Aqueduct, ridiculous as it should have been deemed but a few years ago, seems now almost imminent. In connection with the subject, the following is apropos:

"On March 12, the Commissioner of Public Works was waited on by a delegation appointed by the residents of Lenox Hill (the neighborhood of Seventieth street and Madison avenue), and was requested to increase the Croton water facilities in that locality. The commissioner requested Mr. Tracy (who was present), the Chief Engineer of the department, to see that the wishes of the citizens were carried out. For eighteen months past residents of the neighborhood have had no water above the first floor."

HOBOKEN.—March 9, the member from Hoboken introduced into the N. J. Legislature a

"Bill to provide the city of Hoboken, the town of Union, and the township of Weehawken and West Hoboken, and in certain contingencies, other cities, towns and townships in Hudson county, with pure and wholesome water. The bill gives power to two commissioners from each city and township, in conjunction with the chairman of each township committee, to build water works and adopt such other means as they may deem necessary to provide a supply of pure water."

[This is the Hackensack scheme, which we have examined and condemned. It is asserted that if submitted to the people directly, none of the towns interested would vote for it.]

HACKENSACK, N. J.—The water company of this place ask for a supplement authorizing an increase of their capital to half a million of dollars.

Water pipes in Portland, Maine, froze at six feet in depth during the past (?) winter. In some other cities seven feet even is stated as the depth.

ENGLEWOOD, N. J.—Mr. Dayton introduced March 5, at Trenton, an act to provide for sewerage and pure water in Englewood, Bergen county.

LONDON WATER.—A month ago, we gave editorially an account of the recent bad developments regarding the water of the British metropolis in December 1874. We have since some later facts:

Dr. Frankland, reporting on the water during January, states that the Chelsea, Grand Junction, Southwark, and Lambeth Companies, again furnished Thames flood water of "very bad quality," and far inferior to that delivered by the West Middlesex Company. The London Company's water, derived partly from the Lea and partly from the Thames, as regards "dissolved organic impurity," was no better than the Thames flood water. The New River Company's water was inferior to that supplied in December, but was much superior to any river water of the other companies. The samples of the Chelsea, Southwark, and Lambeth Companies' waters were somewhat turbid from imperfect filtration, and the suspended matter in each case contained moving organisms, "whilst considerable quantities of the mycelium of a fungus were found in the Chelsea and Southwark waters." The Kent Company's water, from deep wells in the chalk, was uniformly bright and palatable.

The Law of the Diffusion of Gases.

At the Ordinary Meeting of the Manchester Literary and Philosophical Society, on the 1st February, Mr. Henry H. Howorth read a paper on "Some Doubts in regerd to the Law of the Diffusion of Gases," the substance of which is given in the *Chemical News*.

The author said that he had a difficulty in reconciling the conclusions drawn by Dalton, Berthollet, and Graham, respecting the diffusion of gases, with the actual facts of nature; and it seemed to him that the only way in which the inference drawn from experiments in the laboratory and what was going on in nature could be reconciled was in the belief that either diffusion was extremely slow in some cases, or that it was sometimes prevented.

He argued that the continuity of condition between gases and liquids, which had lately been so admirably illustrated, made it *a priori* probable that similar laws prevailed in both classes of matter in respect to their laws of diffusion, etc., and that, as in the case of liquids, the law of diffusion was not a universal one, but had at least apparent exceptions, as also among gases there might occasionally be conditions which resisted or very greatly impeded the operation of the law. He granted at once that the gases that form air, and many others, bear uniform testimony to the correctness of the generalization; but in the case of carbonic acid, watery vapor, and hydrogen there seemed to be some room for doubt. The fact that in all abandoned wells, tunnels, and mines, where atmospheric currents do not play, and where there is an accumulation of carbonic acid gas, although these hollows have ample access to the air, goes to show that the rate of diffusion must be exceedingly slow in these cases, if, in fact, diffusion be not actually suspended. The mephitic vapors in low valleys in volcanic districts, and the gases that generate malaria in many low-lying marshy districts—such as the Maremma, in Italy, the neighborhood of Montpelier, in France, etc.,—seem to point in the same direction. The very diverse condition in regard to the amount of watery vapor contained in contiguous areas of the atmosphere, whether we examine it in different neighboring localities or in the superimposed strata of air in any particular locality, show that the working of the law of diffusion is here greatly impeded.

In regard to hydrogen, the evidence is somewhat different. It is clear that if, under certain conditions, hydrogen be an exception to the general law of the diffusion of gases, and follows rather the more general law of gravitation; that it will exist in a stratum above the atmosphere and beyond the reach of direct observation. In his experiments upon the occlusion of gases, Mr. Graham examined several ærolites, and found that under the air pump they parted with a very large quantity of occluded hydrogen. If, as is probable, the gas was occluded by the ærolites when at a red heat, and this red heat was coincident with their passage through that layer of the upper atmosphere in which the phenomena of shooting stars and of the aurora occur, it seems more than probable that this stratum is a layer of hydrogen. This is confirmed by what we know of the spectrum of certain auroras, which resembles those of the zodiacal light and the solar corona. The spectrum of the corona has been the most attentively studied, and Janssen, perhaps the greatest authority on it, speaks most confidently about its distinguishing feature being the hydrogen lines, while a special line which characterizes both its spectrum and that of the aurora, and which is different from that of any terrestrial substance, is considered by Father Secchi to be an abnormal hydrogen line. Dr. Dalton long ago argued, as Mr. Baxendell has reminded Mr. Howorth, that the peculiar features of the aurora could best be explained by the hypothecation of a stratum of some peculiar gas above the atmosphere. A gas of a "ferruginous nature" is the expression of Dr. Dalton. Now hydrogen in the higher chemistry is not only classed among the metals, but Faraday and others have shown that in its relation to magnetism it is nearly allied to iron, so that a stratum of hydrogen above the air would seem to exactly answer Dr. Dalton's postulate. If it should exist, the earth would resemble the sun in one remarkable feature, for we now know that the sun is girdled with an immense layer of hydrogen. Lastly, he added that the heterogeneous texture of the gaseous nebulæ, like the great nebula in Orion, seems to argue that the law of the equal diffusion of gases does not prevail there.

Mr. Howorth presented these facts with considerable hesitation, his excuse for doing so being his view that all physical laws are tentative only—that is, they are good as long as they explain all the facts, and no longer, and that it sometimes becomes a duty to present apparently aberrant and abnormal facts to an audience so well qualified to criticise them as the Manchester Literary and Philosophical Society, in order that they may either be brought within the law, or that the law may be revived.

Kentucky agriculturists are still cutting tobacco, but the yield is so small and the price therefore so high that smokers had better cut it too.

[Above in type so long as to be obviously out of date; all but the advice, which is much cheaper than the tobacco, as nobody will take it at any price.]

Correspondence.

[Correspondents, in all cases, should sign their communications with their names and address in full—not necessarily for publication, but as a guarantee of good faith.—Ed.

Rejoinder of Mr. St. John to Mr. Smedberg.

[In justice to Mr. St. John, we would again state that the following was intended for our last issue, but, through a misunderstanding, delayed too long.—Ed.]

New York, March 13, 1875.

Mr. Editor: In your issue of the 2nd inst. I was pleased to read a communication from Mr. James R. Smedberg, making allusions to mine of February 2nd, in which he pays me several left-handed compliments which I duly acknowledge; and am pleased to learn that the St. John and Rockwell Scrubber has attracted the attention of so eminent a gas engineer as Mr. Smedberg; and believe also that it will go far to convince all gas engineers that the apparatus at Harlem is a good one, notwithstanding, as Mr. Smedberg says, that the principles involved are illustrated by the labors of others. In reply to Mr. Smedberg, I would state that I made *no mistake* when I asserted that as yet no surety had been presented, except this new device, by which coal tar, naphthaline, etc., etc., were effectually disposed of.

In relation to this American gas works recently built, that seems to have no location, with the following sequence of apparatus:

1st. Retorts.
2nd. Multitubular Condenser.
3rd. Cataract Washer.
4th. Exhauster.
5th. Lime Boxes.

which, by his own acknowledgement, worked so imperfectly; that, to remedy the trouble shown, a Audouin end Pelouze condenser followed by two scrubbers was placed between 3rd (or cataract washer) and 4th (exhauster) which would make the Audouin and Pelouze condenser No. 4 and the two scrubbers 5 and 6 with the exhauster 7, and the lime boxes 8; quite an extensive line or chain of apparatus for the purification of coal-gas, to say nothing of the application of a circulating volume ol 200 gallons of gas liquor and 12 gallons pure water additional, for every ton of coal employed.

This new condenser of Audouin and Pelouze, according to Mr. Smedberg, involved the necessity for the introduction of his improvements of reversed flow and differential action of this immense volume of liquor, and the additional 12 gallons of water, to imperfectly accomplish the arresting of the coal-tar and naphthaline products, which have been so quietly disposed of by the undeniable and incontrovertible action of *one box* of the St. John and Rockwell Co.'s scrubber.

Again, Mr. Smedberg says the gas is absolutely dry on leaving the condenser, but picks up from the subsequent scrubbers which have been inserted, a noticeable quantity of liquid, which is mainly recondensed in the purifiers. Of what utility is this? Where is the necessity? He fails to show its importance. They must have been constructed for some purpose; and all that is shown by Mr. Smedberg of their action is simply to contribute moisture after it has once been extracted, for no purpose whatsoever, except to be reabsorbed by the gas and recondensed in the purifiers. The gas being absolutely dry on leaving the condenser, is in a much better condition for the purifiers than if subsequently loaded with moisture by being passed through the two scrubbers. In comparison with his old apparatus, and the Audouin and Pelouze condenser with his improvements, he states that there were but two (2) grains of ammonia per 100 cubic feet of gas. I am surprised that there should have been any ammonia, with a circulating volume of 200 gallons of liquor per ton of coal employed with the 12 gallons of pure water additional.

Once more. The working apparatus of the Audoin and Pelouze condenser being 1-16th of an inch diameter, their speedy obstruction might have been anticipated. If I understand the article of Mr. Smedberg, this would have taken place very soon, had it nof been for the action of the 2nd and 3rd, that is the multitubular condenser and the cataract washer, which must have reduced the quantity of tar, according to his own statement, to two gallons to every 10,000 cubic feet of gas—merely a nominal quantity—before entering the Audouin and Pelouze condenser. As it was, however, it became so heavily loaded with naphthaline deposits that it required to be steamed out. This is in accordance with my opinions previously expressed, that as yet there had been no surety or guarantee presented except this new device, the St. John and Rockwell scrubber, for the removal of tar and naphthaline.

I will now present, as an offset against all this chain of apparatus at this American gas works, one simple box of our scrubber, size 24 by 30 inches, and challenge the presence of tar or naphthaline beyond this point, on a manufacture of 1,500,000 to 2,000,000 cubic feet per diem, with 29 inch connections. In proof of which is offered the working of the scrubber at the Harlem Gas Works for over fourteen months, without the slightest appearance of either of the above named products. On recent examination made of the condition of the scrubber at the Harlem Gas Works, the corrugated plates in the upright pipes showed no deposit or secretion, and were as clean as when taken from the foundry; the sand adhering to the castings was not even discolored. This would show that there would never be any cause for *steaming*. Hence we have not made any provision for the same. The tar is disposed of by cohesion, and the naphthaline dissolved by the coal oils in the liquids.

I agree with Mr. Smedberg, when he says that to separate the gas from the tar and liquor at the hydraulic main is entirely wrong: also that the apparatus at Harlem is based upon the true principle of employing the solvent or purifying power of all the liquid products of the coal; but I do not agree with him when he says that I only express the modern English theories, etc., etc.

These modern English theories referred to, must have a subsequent date to the ideas I have set forth upon the principle of the St. John and Rockwell scrubber. I will refer Mr. Smedberg to the files of the London *Journal of Gas-Lighting* of 1872–73, at the meetings held in the city of London before the Board of Trade, in reference to gas manufacture.

Among the reports received and papers read from the gas engineers and other gentlemen, some of them bearing directly upon dry scrubbing, there and then, there was an instance cited of a dry scrubber that had been in operation but three months, when it was opened and found to be literally choked up with tar, etc., etc., and in their deliberations it was concluded that the method was utterly impracticable. Previous to this, patents had been issued to us, embracing the principles which we claim. Since that time, I was introduced to the eminent chemist Dr. Versmann of London (by Dr. Chandler), who was then the consulting chemist of the Commercial Gas Works of London, and with whom I had several interviews. After having our principles explained and fully set forth he did not hesitate to express his admiration, and said that they were in advance of the age. This seems to me should put a *quietus* on the statement about modern English theories.

A mere allusion to cooling short of the frost-point. I have expressed on previous occasions, my opinions, based upon actual results, that the heat in the vapor is owing to the finely divided atoms of tar and naphthaline; and, when these are extracted, as they most assuredly are in *one* of our boxes, the gas is necessarily cooled.

Back Pressure.—This objection insinuated by Mr. Smedberg, is easily answered. Upon the four boxes we propose to use one inch seal or less; which is all that is requisite to accomplish the desired results, not admitting at the same time that the pressure present in any and all gas works has any thing to do with the condensation of gas proper, but only with what is held in suspension. In case either the exhauster or the engine needs repairing, provision has been made at the end of the scrubber, of an arrangement with a Ludlow valve, having a capacity to discharge all the liquid in the boxes in a few seconds, say less than a minute; and it is *then* as good a machine as the Pelouze & Audouin condenser. The reason why a series of boxes is constructed, is not for the purpose of extracting tar or naphthaline, but to apply the solvent properties of the water in combination that is not exhausted in the first box, in order to arrest the last vestige of the *ammonia*.

The action of the Audouin & Pelouze condenser Mr. Smedberg says should be verified, and if scrubbers should be used they should be followed by another Audouin & Pelouze condenser, so that only dry gas should enter the lime boxes. No one should know this better than Mr. Smedberg (for this American gas works has both) for he seems to know all about them, and he has stated that the gas was absolutely dry, but was remoistened by passing through the two scrubbers, to be recondensed in the purifiers. The scrubbers, he also says, should be followed by another Audouin and Pelouze condenser, to make all of this machinery acceptable in his view. A changing of position of apparatus, that is, allowing the gas to pass the scrubber first and then the Audouin & Pelouze condenser, would afford Mr. Smedberg the opportunity of conveniently working two tiers of lime each ten inches in depth.

After reviewing Mr. Smedberg's letter; I am of the same opinion still as heretofore expressed, that the principles embraced in the St. John and Rockwell Co.'s scrubber are inviolably and incontrovertibly true.

Mr. Editor: In conclusion, notwithstanding all the exceptions that have been taken to our method of the treatment of coal gas, I would here state, on behalf of the St. John and Rockwell Company, that they are ready to furnish any gas company one of the scrubbers, and will guarantee not less than 11,000 cubic feet of 17 to 19 candle gas from a ton of ordinary coal, such as Murphy Run, Penn, Westmoreland, and other similar coals, without the use of Cannel or any other enriching material; also furnishing a gas of unequalled degree of purity; using either lime or oxide of iron for purifying.

Truly yours.

W. H. St. John,
207 East Fifty-second Street, N. Y.

A Gas-Works Flooded.

Knoxville, Tenn., March 16, 1875.

Mr. Editor: You have not had the pleasure of hearing from these parts for a long time. I suppose you have observed in the papers that we have had extraordinary floods in Tennessee. Our usual quiet, useful, little river suddenly took it into its *head* to "strike," It rose slowly but surely and took possession of the yard, got into the ash pans, and quenched the fires. The retorts fought and hissed and sputtered and cracked, but to no purpose; they soon *cooled down*—the water conquered and rose to the top of the hydraulic main, forty feet above its usual level, and remained at that interesting point for two days, doing all the mischief it could; then it quietly and thoughtfully receded, leaving behind it a rich deposit of pulverized soil or mud twelve inches thick over the whole yard—a splendid material for farmers, but sadly out of place in a gas works.

As soon as I could dig my way into the retort house I started the fires. I used "Sellers cement" freely on the retorts (clay) and in four days I was making gas. The first charge they leaked pretty bad, the second charge not so bad, the third charge I could scarcely detect any leak; I was agreeably surprised at this, for I certainly thought the retorts were ruined. I write this experience for the benefit of any gas engineer who perchance may be placed at some time or other in the same pleasant situation.

However, in spite of the flood we are going ahead.

We have lately reduced the price of gas, and I am now engaged in laying eighteen thousand feet of main. *Nil desperandum.* Respectfully,

JAMES SOMERVILLE, Sup't.

The Des Moines Explosion—A Correction.

DES MOINES, IOWA, March 15, 1875.

Mr. Editor: Permit me to correct the false report copied into your issue of March 2nd, concerning our explosion. The facts are as follows:

The explosion occurred at 12.45 on the morning of February 18, in the wing of our works comprising the lime room, purifying room and meter room, and blew that part of the works all to pieces and ruined two purifiers; but strange to say left two purifiers, the center seal and station meter, standing in position uninjured.

The gasometer did not explode as was reported, but only had small holes blown into it, which were easily repaired.

The cause of the explosion was gas escaping in the cellar from a cock carelessly left open, ascending to rooms abeve, and igniting from a gas jet burning in the meter room. Three men were slightly injured. We supplied the city again with gas in just ten days from time of explosion. Yours truly,

G. B. WICKS, Sup't.

Gas Mains.

NEW YORK, March 29, 1875.

Mr. Editor; As the time is appaoaching when the frost will be out of the ground, and many leaks in the gas pipes will follow, permit me to call the special attention of gas-light companies and gas engineers to the importance of putting in valves when they have occasion to break ground, in order that they may shut off a district for making repairs, and thereby save gas from being lost; or in case of fire to avoid adding to the flame and extending the gas to other buildings; the fissures in the walls permitting the gas to escape through them, and also into the attics of many blocks composed of combustible materials.

A SUFFERER FROM BROKEN GAS PIPES IN AN ADJOINING BUILDING.

M. Martin's Process for the Production of Illuminating Gas.

The following details of the specification of the patent taken out by M. Martin for his new process for the production of illuminating gas from peat or wood steeped in naphthaline, are taken from our contemporary *Le Gaz:*

"In prosecuting our researches upon the value in gas manufacture of the non-crystallizable and liquid hydrocarbons, it occurred to us that a material capable of furnishing a supply of illuminating gas might be prepared with naphthaline.

"As naphthaline has not as yet been employed commercially in gas manufacture, we examined its formula (C_{10} H_8), and in the first place directed our labors to the combination with it of a liquid hydrocarburet, rich in hydrogen, which would decompose at the same degree of heat as the naphthaline itself, with the object of rendering this mixture of hydrocarburets susceptible of absorption by some porous body, which in decomposing would furnish proto-carburetted hydrogen.

"This we accomplish by preparing a liquid carburet of hydrogen with heavy petroleum oil, or with any other hydrocarburet decomposing at the same temperature as the naphthaline.

"The operation is conducted as follows:

"We take 100 kilogrammes (220 lbs.) of the crude naphthaline extracted from the heavy oils obtained in the process of gas manufacture, and liquify it at a temperature of from 46° to 50° C. To this liquid is added, according to the richness of the gas we wish to produce, from 5 to 25 per cent. of its weight of prepared petroleum oil, or other hydrocarburet decomposing at the same temperature as the naphthaline, in order to assure assimilation.

"In this mixture, heated to the temperature previously stated, is immersed a certain quantity of peat, or some other porous body capable of furnishing protocarburetted hydrogen, and prepared in such a way as to be able to absorb from 13 to 14 per cent. of the naphthaline. This may be effected either by steeping the peat or other body in the naphthaline itself, or by injecting the liquid under pressure.

"Prepared in this way, the peat or other carburized material will be found to yield, using the ordinary gas apparatus, from 13,500 to 15,000 cubic feet of rich gas per ton of 1000 kilogrammes of peat coke simultaneously produced: and, according to the richness of the mixture in which the peat has been steeped—in other words, in proportion to the percentage of petroleum oil it contains—we obtain gas of from 7 to 24 candles illuminating power, with a consumption of 3·7 cubic feet per hour.

"Although, as we have remarked, this carburized peat may be employed alone with excellent results, we were desirous of producing a new composition available for the production of gas, and also as a substitute for the Boghead and other cannels which are now employed to enrich ordinary coal gas, but which produce little or no coke. For this purpose we made a mixture composed of

Carburized peat.....	60 to 70 kilos.
Rich gas coal.....	30 to 40 "
Lime.....	1 kilo.

These substances are ground up together with 10 or 12 per cent. of a mixture of coal and wood tar, and, the entire mass being thoroughly worked up, it is compressed by machinery into blocks of any shape required.

"This composition produces from 15,000 to 15,500 cubic feet of gas per ton, which, consumed at the rate of 3·7 feet per hour, gives an illuminating power of frem 18 to 20 candles; it also yields about half a ton of a vegeto-mineral coke, which, by its porosity and general composition, forms an excellent substitute for coal for domestic purposes, and for charcoal in those operations where that article is now generally employed. It is unnecessary to add that the quantities of coal and carburised peat employed in the production of this composition may be varied.

"We claim, therefore, as our invention, the novel application or employment of prepared naphthaline in the manufacture of gas, and also the production of a combustible material useful for domestic purposes. —*London Journal of Gas-Lighting.*

A Cheap and Brilliant Light.

Prof. John Spiller communicates to the London Photographic Society, the following method for a temporary light of great power, useful for photo and other purposes:

"When common saltpetre (nitrate of potassium) is heated to a temperature somewhat beyond the point of fusion, in a hard glass tube or porcelain capsule mounted over a spirit lamp, and small pieces of sulphur are then successively introduced, a deflagration ensues, accompanied by the emission of an exceedingly brilliant white light, which is maintained as long as any of the sulphur remains floating as a molten globule in the fluid nitrate.

"The cost of this light is very trifling, both ingredients being remarkably cheap. One ounce of niter melted, and fed with sulphur at the rate of eight or ten grains at a time, will keep up a brilliant light for about ten minutes, at the cost for materials of one cent; but it must be confessed that the wear and tear of apparatus, from the intensity of the heat, adds to the cost of production.

"To guard against fracture or actual perforation of the glass during the course of the experiment, it is necessary to provide a tin tray into which the fluid contents of the flask may drop in case of accident. An ordinary spirit lamp is found to give sufficient heat to melt the niire and start the reaction; when once the light is produced, the spirit lamp may be removed, or the holder supporting the flask turned aside. Short lengths of stout 'combustion tubing,' closed at one end, serve exceedingly well for making the experiment, this kind of glass being so difficultly fusible. If iron capsules be employed, it is only possible to work with the top light, which may, however, be reflected th any required angle; and with porcelain crucibles much of the effect is lost by the partial opacity of the material. In the event of the nitre-sulphur light being required to be maintained for a lengthened period, it would, of course, be desirable to provide some kind of chimney to carry off the gaseous products of combustion, or to absorb the sulphurous acid with peroxide of manganese.

"With respect to the actinic value of the light, I find that from three to five seconds' exposure, according to the density of the negative, is sufficient to give a collodion transparency at a distance of a foot from the source of light, when produced on a small scale. The maintenance of a constant degree of intensity is, perhaps, one of the points open to future improvement.

"I have tried the use of nitrate of sodium in place of the ordinary saltpetre, and experimented with various metallic sulphides and finely divided metals; but none of these answered so well as the simple attack of sulphur, in the form of roll brimstone, by meltod nitre. Their spectra also appeared to be more limited. With the chlorate of potassium and sulphur a light of dazzling brilliancy is emitted; but the deflagration is very violent, and white fumes are given off by reason of the greater volatility of the chloride of potassium—a by-product in this reaction.

"In conclusion; I have only to state that no claim of novelty is set up for anything beyond the photographic use of the nitro-sulphur light, the light itself having been shown as a lecture experiment certainly as far back as the year 1847."

The Chandor Light.

At a *bonversazione* recently held in Edinburgh, Prof. Archer drew attention to a new and very important invention—the Chandor light—which really threatens the lucifer trade with extinction. The apparatus is, in outward appearance, a little tube 3 in. or 4 in. long, having at one end a revolving button which turns a screw, and at the other a minute angular point of metal, which also revolves, passing over a little orifice in the closed head of the tube. A continuous fuse, formed of a delicate strip of solidified collodion, with a ridge of hardened phosphorus on one of its sides, is slipped into the tube, and once in position, can be moved upwards by the screw. By the same action which presses the upper end of the fuse against the opening at the top the metal point is turned upon the phosphorus, and a small portion of the collodion is thereupon ignited. When the apparatus is affixed to a gas-burner only a very transient flash is needed for the purpose of ignition, and not moro than a seventieth part of the collodion fuse is in that operation consumed. Where, however, the wick of a lamp has to be lit by the same means, a larger portion of the fuse, the thirty-second part, in fact, is burned. The apparatus is either portable or adapted to the uses indicated. If a lamp goes out it can be instantly relighted by the turn of a screw, instead of by opening the case, removing the chimney, and striking a lucifer match where, perhaps, large quantities of straw are lying about. The collodion fuse is so little liable to be effected by damp that it will ignite after having been immersed in water, and its action has never been known to fail. Being encased in a close-fitting chamber within the tube it cannot burn beyond the requisite point where its duty is discharged, and the cotton wick, or invisible spirit of gas, "starts into light and makes the lighter start"

A French savant doesn't believe that guano was deposited by birds, but says it is composed of fossil remains. He is probably thinking of the I-guanodon.— *World.*

☞ *For other reading matter see page* 10.

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FRIDAY, APRIL 2, 1875.

WISHING TO MAKE THIS JOURNAL an organ of intelligent discussion to those of our readers who may wish to gain or give information on the subjects to which its columns are devoted, the publishers solicit letters from all among them who make the study of these subjects a pleasure, or a profession.

Subscribers would confer a favor upon us by remitting *CHECKS*, or *POST OFFICE MONEY ORDERS*, as we are frequent losers where money is enclosed in letters.

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THE AMERICAN GAS-LIGHT ASSOCIATION.—A CIRCULAR FROM THE SECRETARY.

OFFICE OF AM. GAS-LIGHT ASSOCIATION,
117 B'WAY, N. Y., March 24, 1875.

The second semi-annual meeting of the American Gas-Light Association will be held in Washington City, on the 12th of May next.

The headquarters of the members will be at Willard's Hotel. The committee appointed for that purpose have not yet perfected their arrangements, but a visit of the members in a body to the President at the "White House," also an excursion down the Potomac as far as Mount Vernon, have been suggested. A visit to the gas works of that city will of course be made.

If at this visit to the Washington City Gas Works, the members of the Association can learn how to produce as much gas, and of as good quality, from a ton of coal as Mr. McIlhenny now does, they will be richly compensated for all their time and expense. The gas manufacturers of the United States and Canada are respectfully invited to attend the meeting, and become members, if not already members.

To be eligible as an active member a person must be a president, vice-president, director, treasurer, engineer, consulting engineer, or superintendent of a gas company, or an individual manager of a gas works, or a person practically skilled in the construction of gas works.

CHARLES NETTLETON,
Secy. Am. Gas-Light Association.

LONDON GASES.

Reports appear, from time to time, under the present admirable system controlled by the London Board of Trade, relative to the value and purity of the gases of the different Companies of the great British Metropolis. It seems to us almost useless, as things look, for us to sigh for something of the sort here. Bills brought before our State Legislatures, looking to the establishment of gas-inspection, emanate always from some party, or parties, whose inspiration are place, pelf, power or popularity, and hence the framing of such instruments always betrays such a foolish and mischievous ignorance of the high branch of Applied Science they relate to, and such defiant contempt of everything and everybody whose just rights should be considered, and whose voice should be heard, in such a matter; that no reasonable legislative body can be induced to entertain them seriously. Some of our gas-men, of the first rank in this metropolis, have expressed themselves publicly as in favor of a *just* and *fair* law regulating quality and purity; but what the authors of the "gas-bills" want, has no relation to purity of any kind, but on the contrary, quite the reverse.

Dr. Letheby, the Chief Gas Examiner of London, has recently rendered to the Corporation of that City, and to the Metropolitan Board of Works, a report on the quality of the gas supplied by the Chartered, the Imperial, and the South Metropolitan gas companies during the last quarter, which gives so thorough an idea of the present status of our art in that great focus of civilization, that we shall give some space to a summary of its substance.

He states that the average illuminating power of the common gas of the Chartered Company at the four testing places was as follows:—At Beckton, North Woolwich, 17·46 candles; at Cannon Street, City, 16·68 candles; at Friendly Place, Bow, 17·02 candles; and at Ladbroke Grove, Notting Hill, 16·63 candles. The gas supplied by the Imperial Company averaged 16·68 candles at Carlyle Square, Chelsea; 15·63 candles at Camden Street, Camden Town; 16·58 candles at Graham Road, Dalston; and 17·36 candles at Bruce Terrace, Bow; while that of the South Metropolitan Company at Hill Street, Peckham, was 16·42 candles. The lowest illuminating power during the quarter was 15·5 candles in the case of the Chartered gas; 14·3 in that of the Imperial; and 15·3 in that of the South Metropolitan. The cannel gas of the Chartered Company ranged from 20 standard candles to 22·4, the average for the whole quarter being 20·8 candles. As regards purity, Dr. Letheby reports that on six occasions the gas of the Chartered Company at Ladbroke Grove was charged with sulphuretted hydrogen. The same was the case on five occasions with the gas of the Imperial Company at Bruce Terrace. The average sulphur at the several places was—Beckton, 12·27 grains per 100 feet; Cannon Street, 10·37; Friendly Place, 9·83; Ladbroke Grove, 17·49; Millbank, 17·68; Carlyle Square, 14·99; Camden Street, 17·34; Graham Road, 15·59; Bruce Terrace, 10·83; and Hill Street, 19·86. The proportion of this impurity was in excess of the prescribed quantity on one occasion at Camden Street, on three occasions at Bruce Terrace, and on four occasions at Hill Street, Peckham. All these have been the subjects of special enquiry; and Dr. Letheby states that the excess (sulphur and sulphuretted hydrogen) was due to accidental derangement of valves in the case of the Chartered and Imperial gas, but he was unable to find a satisfactory cause for the excess of sulphur in the gas of the South Metropolitan Company. The ammonia averaged 0·77 of a grain per 100 cubic feet of the gas at Beckton; 0.46 at Cannon Street; 1·11 at Friendly Place; 0·13 at Ladbroke Grove; 0·07 at Milbank; 0·47 at Camden Street; 1·19 at Hill Street; and 0·0 at Carlyle Square, Graham Road, and Bruce Terrace. The maximum of this impuriiy in the Chartered gas was 2·2 grains per 100 feet; in the Imperial gas, 1·5 grains; and in the South Metropolitan, 2·4 grains. In no case, therefore, did the ammonia exceed the prescribed quantity of 2·5 grains per 100 feet.

THE NEW ORLEANS LITIGATION.

After the editorial note on this topic, in our last, and just as we were about going to press, the following reached us, from the New Orleans *Picayune*, of March 10, which throws important light upon the present status:

"The recent decision of the Supreme Court forbids the gas company from vending gas after the 1st day of April; and, if carried into effect, virtually consigns this city to utter darkness for the next two or three years. That corporation with $2,500,000 invested in extensive works and 150 miles of pipes spread under every portion of the city, having lighted the same satisfactorily for the past forty years, is forbidden to violate the monopoly rights of a paper charter created in 1870, the proprietors of which have not taken one single step toward fulfilling the pretended objects of their corporation. To duplicate the existing works and mains of the old company, an outlay of at least $2,000,000 will be required, and the work cannot be completed in less than two years, during which period we shall realize the fable of the dog in the manger, who unable to eat the hay himself prevented the unfortunate cattle from doing so.

"For many years the stock of the gas company has been the favorite investment for trust funds, and much the largest portion of its capital is held by widows and orphans, and citizens of limited means retired from business, whose sole income is derived from this source. Should the decree of the Supreme Court be enforced, not only will they be deprived of their income, but their whole property will become worthless except for old bricks and scrap iron.

"It is fortunate that several important constitutional questions are involved in the case, and the Supreme Court of the United States will have an opportunity of redressing this legislative violation of solemn charter obligations, and preventing a result equally wicked and ridiculous, although perfectly in keeping

with the general course of events in our unhappy State during the past five years.

"The late Chief Justice Eustis always strennously objected to what are called "paper cases" for the adjustment of future or doubtful questions. It has been reserved for his more liberal successors in office to adopt a far wider policy in the present instance, and award to an empty paper case, presented by daring and unscrupulous speculators, the equally empty right of lighting the city of New Orleans for fifty years after the first of April, to the prejudice of the only real company who possess the means and facilities, and who are actually fulfilling the this important duty to the satisfaction of the public, and at a lower price."

Under the telegraphic head, in the same paper, we found also the following:

"WASHINGTON, March 9.—In the case of the New Orleans Gas-Light Company the record has just been filed in the Supreme Court of the United States. A motion has also been filed by the Crescent City Company to dismiss the writ of error for want of jurisdiction and to increase the penalty of the bond."

If this "writ of error" *has been* dismissed, New Orleans must have ceased to be lighted at all on the first of this month; in compliance with the injunction of the Louisiana Court—as the new would-be monopoly has no plant—neither works nor pipes. It certainly seems incredible that our National Tribunal could permit or sanction so useless and so disastrous an imposition upon the city and citizens of New Orleans, not to speak of any strangers who may be within her gates.

☞ NOTICE.—We take pleasure in directing the attention of our readers to the advertisement in our columns of the card of Mr. H. Cartwright, Gas Engineer. Mr. C. was one of the first mechanical engineers of this country to turn his attention to the construction and management of gas works, as a specialty; and was engineer in the erection of the gas works at Newark, New Jersey, in 1846; Paterson, N. J., in 1847; New Haven, 1848; Rochester, N. Y., 1848; Syracuse, 1849.

In 1850 he engaged in the contract for building the Buffalo Water Works, and, as engineer, had the charge of the construction of that work, embracing the original and bold scheme of tunneling beneath "Black Rock harbor," and into the Niagara River beyond, as the source of supply—the whole of which was successfully accomplished under his supervision, and the city supplied with water, Jan. 1st, 1852.

Subsequently Mr. C. has been engaged in building other works of similar character, including some 6 years as contractor and engineer in charge of the work of the "Hoosac Tunnel" from 1856 to 1862—which work was then given up to the State of Massachusetts, after penetrating the mountain from both sides about one mile.

In 1862 Mr. C. returned to his "first love," the gas profession, and was identified as engineer and director of several gas companies in which he was interested, until the organization of the American Meter Company in 1863, when he was selected as its Vice-President; and, until his voluntary resignation on the 1st inst., has filled that position with honor to himself and credit to the Company, in the executive charge of their Philadelphia manufactory.

His long experience, and acknowledged ability, qualify him in his profession to give satisfaction in his engagements; whilst his energy and integrity are so well understood as to render it unnecessary for us to add anything on those points, and we can cheerfully commend his services to any gas company needing such as he offers in his card.

We would further add that we have from good authority that under Mr. C,'s instruction the lamented and distinguished engineers, Jos. A. Sabbaton and Geo. W. Parsons, were initiated into the business; men who are justly regarded as having been shining lights of the profession.

APOLOGETIC.

It was due that something should have been said editorially in this issue, upon two most important topics that occupy us in part this time: the past meeting of the New England, and the coming meeting of the National, Gas Associations; but we find no adequate room left, and must wait till the next time.

MECHANICAL & GAS ENGINEER.

To Gas-Light Co's.

The undersigned respectfully announces his voluntary resignation of the Vice-Presidency of the American Meter Company, from the 1st of March last, after filling that position from its organization in 1863, and now offers his services as

Consulting or Constructing Engineer,

in the erection of new, or the extension of Gas Works.

He is prepared to furnish plans and Specifications, embracing all the latest improvements in the MANUFACTURE OF COAL GAS, at short notice, and on reasonable terms. His experience of THIRTY YEARS in the construction of Gas and Water Works, Railroads, Tunneling, etc., enables him to refer with confidence to any of the Works erected by him, as a guarantee of satisfaction and ability.

By arrangements with reliable manufacturers of all MATERIAL and SUPPLIES used by Gas Companies, he is prepared to furnish promptly all such orders, with best selections, and to give satisfaction as to prices, terms, etc., and respectfully solicits a share of patronage.

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NOTICE.

AMER. GAS-LIGHT ASSOCIATION.

OFFICE OF THE AMERICAN GAS-LIGHT ASSOCIATION,
No. 117 BROADWAY, NEW YORK CITY.

THE **SECOND SEMI-ANNUAL MEETING** of the ASSOCIATION will be held at **WASHINGTON CITY, D. C., May 12, 1875, at 10 A. M.**
Headquarters, WILLARD'S HOTEL.

CHARLES NETTLETON, Secretary.

GAS! GAS! GAS!

To all Whom it May Concern or in any wise Come,

I have a Mine of Oxide of Iron, Manganese, Cobalt and Lime used in Purifying Coal Gas, Having been used by the New York Mutual Gas-Light Company for over a year, at a great saving of expense, and known to the New York Board of Health as PARHAMS MIXTURE FOR PURIFYING COAL-GAS.
Any information will be given by S. P. PARHAM, Chief Engineer of N. Y. Mutual Gas-Light Co., Eleventh street, East River, or by DANIEL PITTINGER, Washington, Warren county, N. J. 379-2t

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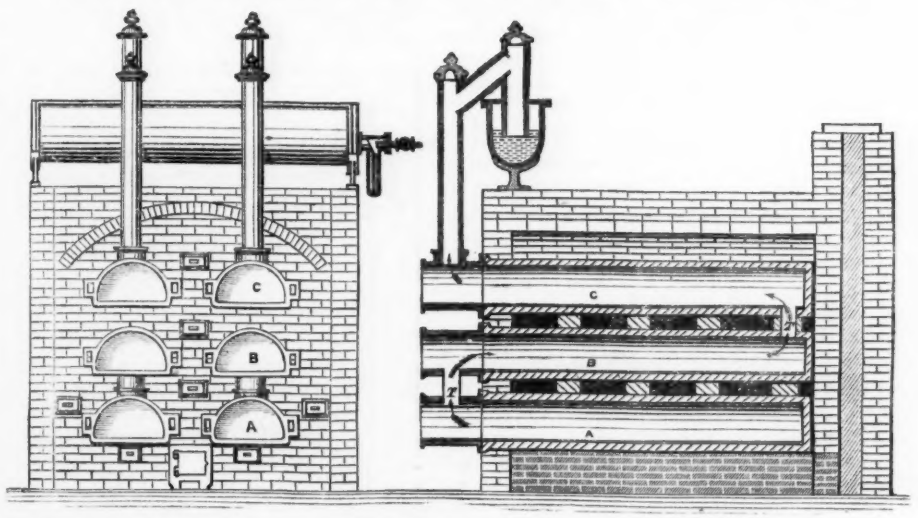

EXPLANATION.

Retort A communicates with B by vertical pipe between mouth pieces A and B; and B with C by tile opening T. All of the retorts are charged with coal; the upper retort, "C," being charged the heaviest. No superheated steam, oil, naphtha, or enriching coals are used.

The gas produced in the lower retort passes through the highly-heated coal in the upper ones, prevents the deposition of carbon and tar, and is thereby enriched and increased in volume.

The practical operation of the process, shows a production of 12,000 cubic feet of gas of over 16-candle power per ton of Westmoreland coal.

The expense of alteration from the customary mode of setting is very slight; and the building of new benches by this process is less expensive than by the old.

For the right to use the same for the State of New York, and for full particulars in regard to the process, apply to **"The United States Gas Company,"** No. 149 Broadway, N. Y.

For States other than the State of New York, apply to **"The Columbia Gas Company,"** No. 49 Broadway, New York.

Gems and Generalities.

Cremation has driven some to express their preference to having their mortal remains sunk in the "ocean wave." To this it has been objected that the first run of shad might summon up the shadows of departed friends.

A centenarian of 101 winters, named Steele, lives at Pascack, N. J. This has been the coldest and iciest winter father Steele has ever seen since he was a boy.

The maximum production of coke in Southwestern Pennsylvania is rated at 250 car loads, or 150,000 bushels a day. The production at present is about two-thirds the maximum, or 170 car loads.

HERE'S RICHNESS.—A resident of Bridgeport, Conn., is the owner of a six-year-old cheese. He says "There's millions in it."

The bill to prohibit the throwing of ashes, cinders, and refuse-matter of all kinds in the water around the city of New York passed the Senate.

A series of experiments has lately been made by the Russian Government with reference to the use of electricity for the head-lights of locomotives.

At Helena, Montana, in January, mercury in thermometers all froze, small quantities of mercury in phials became congealed, and proof whisky placed out of doors froze solid in half an hour.

In the earthquake region of California it is reported that "there is much activity in real estate."

During the tornado of March 4, the vibration of the Cape May Light-House was so great that the oil in the lamps spilled out of the bowls. A bucket of water has frequently spilled over during some of the gales which howl along the coast.

Sometime during the present year a party of one hundred Englishmen is coming over to this country on a grand buffalo hunt. 'ist! 'ush! 'ark!—

The 'orn of the 'unter is 'eard on the 'ill.

COAL-TAR COLORS.—Advices from Europe are to the effect that the prices of aniline colors have lately sunk very low, in consequence of the expiration of some of the original patents under which these colors were manufactured.

This is the first time in the memory of man, says the Salt Lake *Tribune*, that Great Salt Lake has been frozen, and the mercury has not been below zero this winter. Here is a nice question for scientists to explain.

Although the Montreal pilots have resolved that the St. Lawrence river could be kept open all winter, the river with a perversity perfectly wonderful, congealed early in the winter, so that teams have crossed pretty constantly on the ice.

A western paper says: "We have had obituary notices on a standing galley for six months, of a few families in town that still continues to use coal oil in lighting fires. It is only a question of time.

Until the New York State oil-discoveries recently, Tidioute was the most northeasterly oil-yielding point. We now learn that a new oil well, northeast of Tidioute, located on new territory, is nearly down. The owners expect a good strike.

Arctic seals ventured down to many points along the coast of the United States during the past winter, even to New York bay. None that we have heard of sealed their temerity with their lives, however.

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Roman Cement,
Keene's White Cement,

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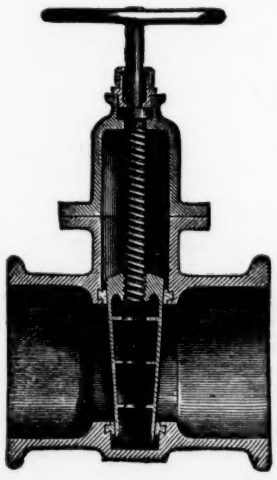

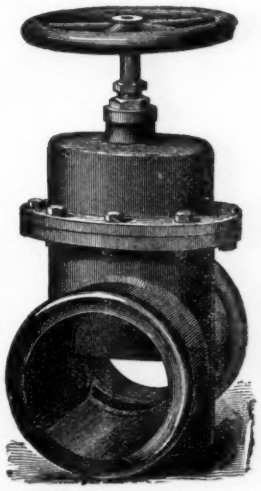

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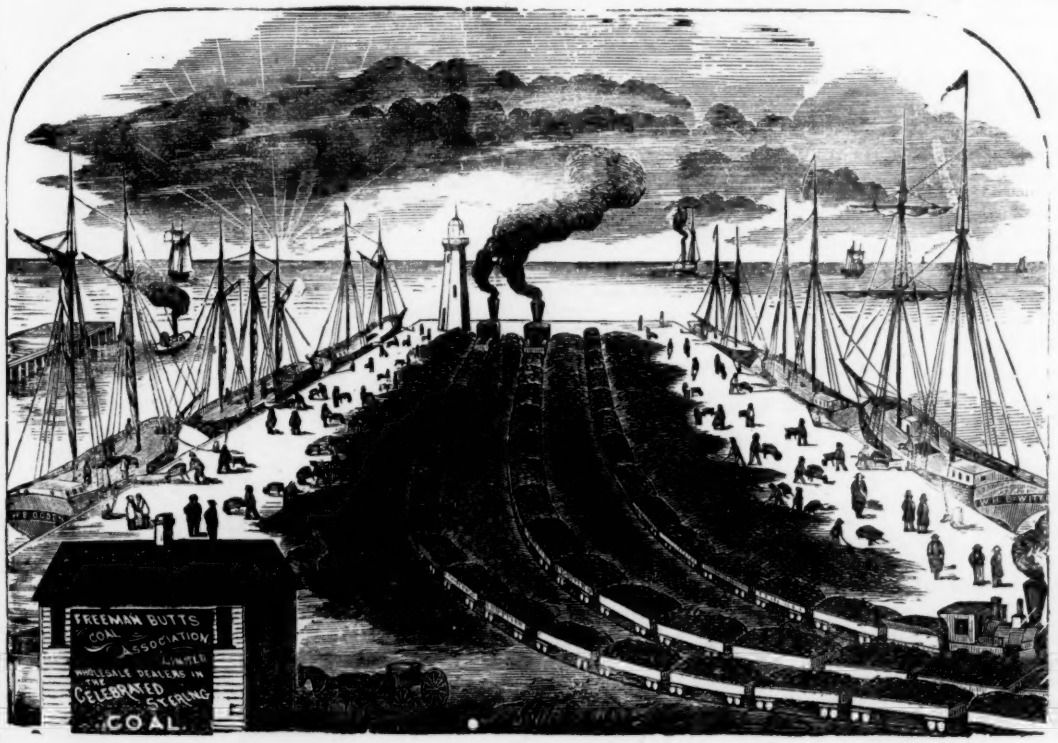

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From Manhattan Gas-Light Co., N. Y.

Yours of the 9th inst. is received. The "Sterling Coal" received from you during the past year worked very satisfactory—averaging 9,500 cubic feet of 15 candle gas per ton of 2,240 lbs., and 41 bushels of coke weighing 1465 lbs. We consider it among the best American Gas Coals for the quantity and quality of the gas produced, and also for the excellent quality of the coke.

I am, gentlemen, your obedient servant,
CHARLES ROOME, Pres't.

From Buffalo Gas-Light Co., Buffalo, N. Y.

The Sterling Coal we have had from you we find to be an excellent gas coal. The yield of both gas and coke is good. The illuminating power of the gas is high and the quality of the coke is very good.

ROBERT ROBSON, Foreman Gas Works.

From Citizens Gas-Light Co.

ROCHESTER, N. Y., Sept. 2, 1874.

Your favor September 2nd at hand. Yield of Sterling Coal to date from July 19, 4-70.

Respectfully yours,
WM. H. WARD, Sec.

Would also refer to the Gas Companies in the following places: New York City (Manhattan and New York Cos), Brooklyn, Albany, Troy, West Troy, Buffalo, Rochester, Oswego, Ogdensburg, Lansingburgh, Newburgh, Rome, Palmyra, Geneva, Yonkers, Rondout, Kingston, Albion, Brockport, Seneca Falls, Elmira and Lyons in State of New York; Cleveland, Toledo, Sandusky, Norwalk, Oberlin, Salem and Fremont in Ohio; Detroit, Ann Arbor, Grand Rapids, Kalamazoo, Jackson and Adrian, in Michigan; Toronto, Hamilton and Coburg in Canada; Chicago, Ill., and two companies in Milwaukee, Wis.

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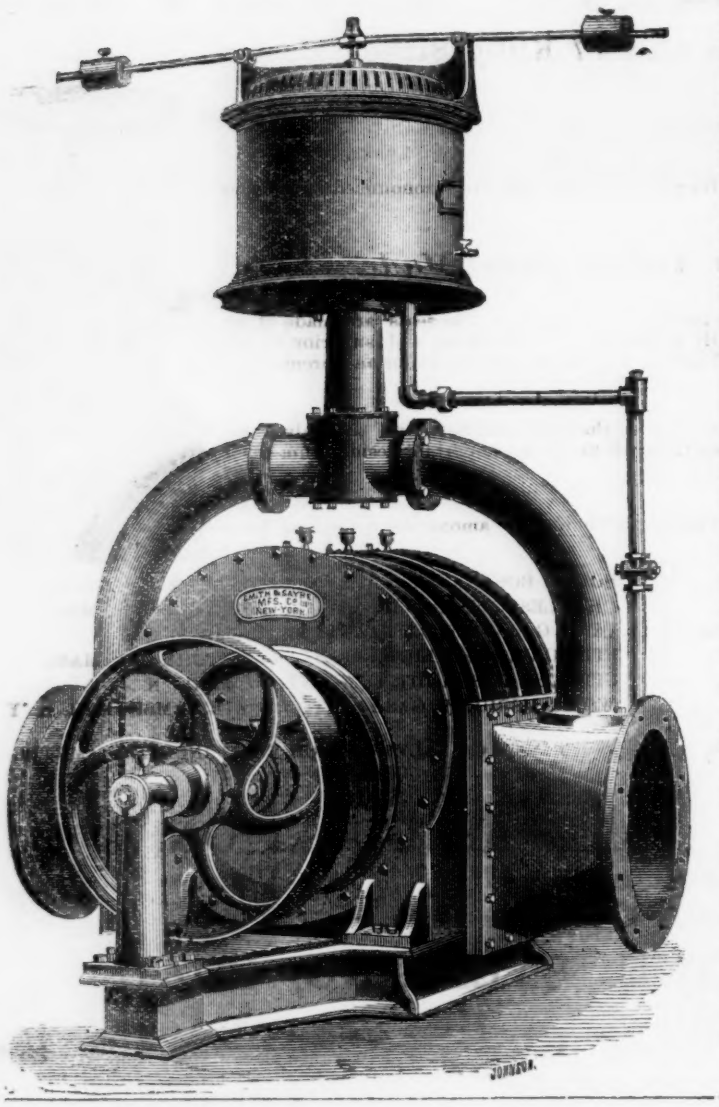

They are made to pass from 4,000 to 150,000 cubic feet of gas per hour; will increase the production and illuminating power of the gas, and add very much to the durability of the retorts, either clay or iron. The Compensator obviates entirely the necessity of water-jo ints, is compact, durable, cleanly, not liable to get out of order, self-acting, quiet, and certain in its operation.

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[Reported Expressly for this Journal.]

MARCH 2, 1875.

DELIVERED IN NEW YORK.

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Ince Hall	$17 00	@	18 00
Kirkless Hall	16 50	@	17 00

English Caking Coals.

Newcastle Gas	$12 00	@	00 00
Liverpool caking	11 50	@	12 00

British Province Coals.

Pictou			2 50
Block House—At Mines, $2 12, Gold			0 00
Caledonia—At Mines, $2 00, Gold			0 00
Little Glace Bay—At Mines, 1 87½, Gold			2 00
Lingan—At Mines, $2 25, Gold			0 00
Sydney—Old Mine			3 00
" Reserve Mine			2 25
" International			— —

(Duty, 75 cents per ton, gold. Freight to New York $2 25 currency. Cost of above coals delivered in New York, $3 25 @ $6 00½, currency.)

Pennsylvania Coals.

Penn Gas Coal—At Amooy	$7 00	@	0 00
Westmoreland—At Amboy	7 00	@	0 00

(In New York both the above coals $7 50)

Shafton	7 50	@	0 00
Youghiogheny	7 75	@	0 00

West Virginia Coals.

MurphyRun	$7 40	@	0 00
Despard	7 40	@	0 00
West Fairmont	7 40	@	0 00
American Gas Coal	7 40	@	0 00
Fairmont	7 40	@	0 00
Newburgh Orrel	7 40	@	0 00
Pinnickinick	7 40	@	0 00
Cloverhill of Virginia	6 00	@	6 50
McKenzie Compound Mixture			— —

American Cannel Coals.

Peytona of West Virginia	$12 50	@	00 00
Darlington of Pennsylvania			— —
Cannelton Cannel			12 50
Red Bank—at Philadelphia			7 00
" —at South Amboy			9 00

Asphalts.

Albertite of New Brunswick	$— 00	@	— 00
Ritchie Mineral of West Virginia	18 00	at Bail'e.	
Trinidad Bitumen	— —	@	14 00

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GLOUCESTER CITY, NEW JERSEY.

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Cast Iron Flange Heating and Steam Pipe.

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GAS HOLDERS.

TELESCOPIC OR SINGLE.

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AUTOMATIC FIRE GOVERNOR.

PATENTED AUGUST 4, 1874.

It regulates the speed of Exhausters by controlling the fire. The least pressure on the Retorts opens the Damper in the Boiler Chimney and under the fire, and closes them as soon as the pressure is removed. Saves the boiler, fuel, and all attention, except to supply the fire. Come and see it, or address

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A YOUNG MAN OF LIBERAL EDUCATION, WHO HAS spent many years in the study of gas, and working in a arge gas works, desires a situation as Superintendent of a works making 10,000 to 50,000 cubic feet daily. Has good reference as to ability; or would act as Assistant in large works. Would prefer a situation on the staff of a gas works ulider—draws well, and has experience in setting up appar-

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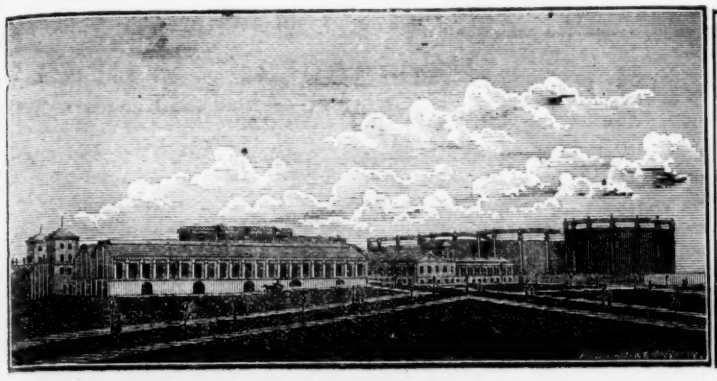

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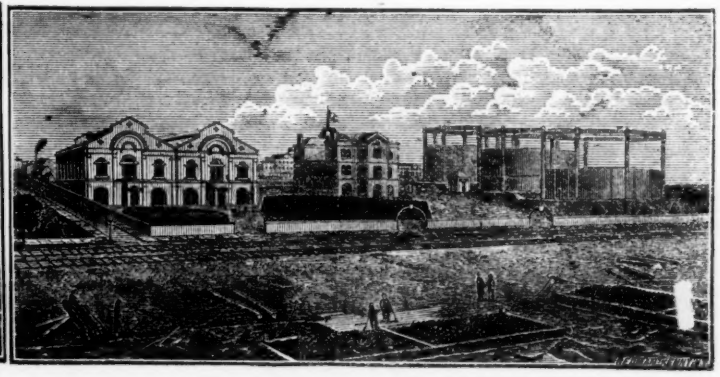

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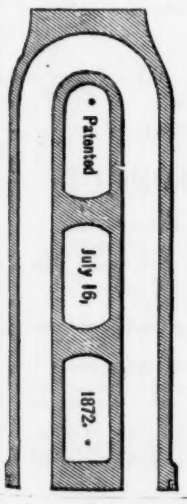

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Sample sent gratis to any Company, if desired.
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On or about May 1st, 1875,
One 8 Ft. STATION METER
complete, of American Meter Company's make, with a capacity of four hundred thousand cubic feet per day.
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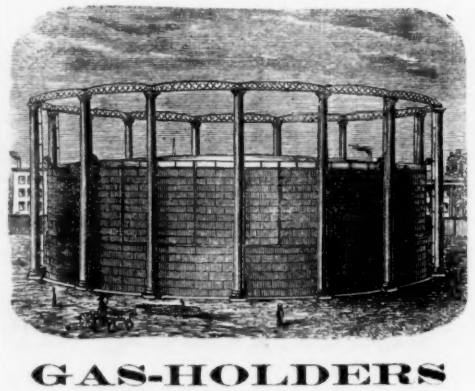

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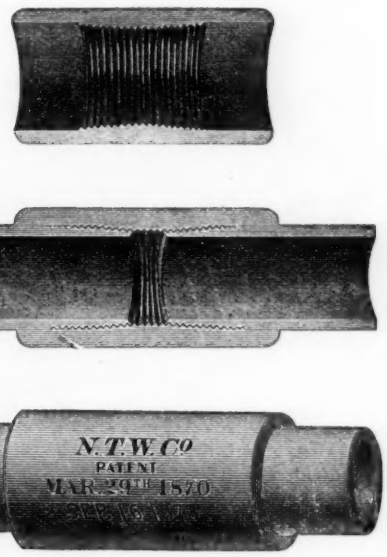

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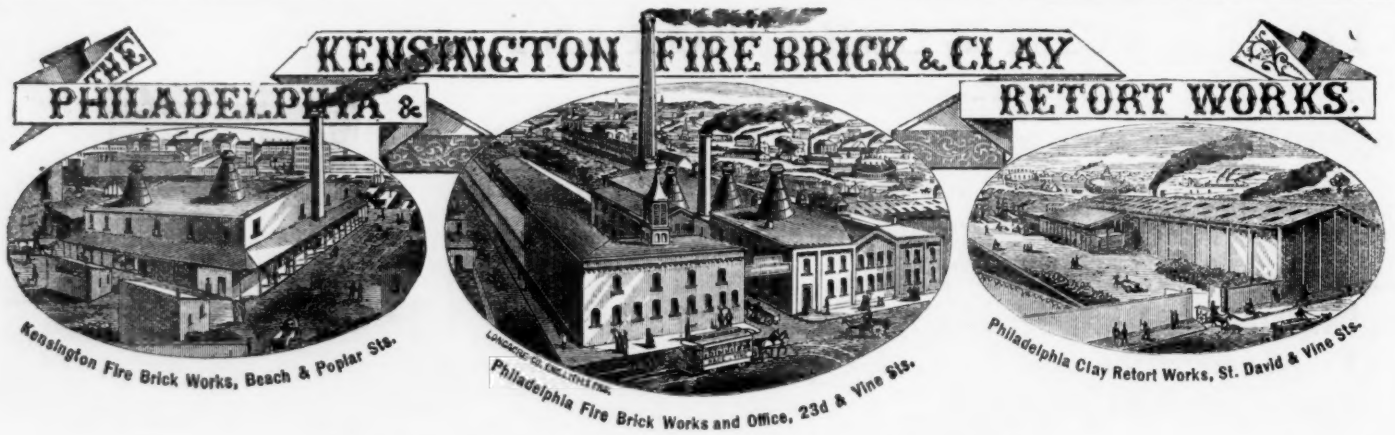
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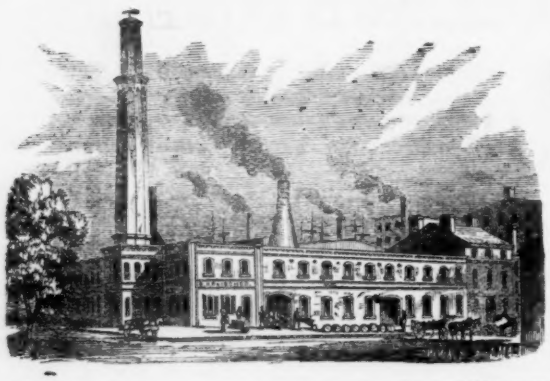

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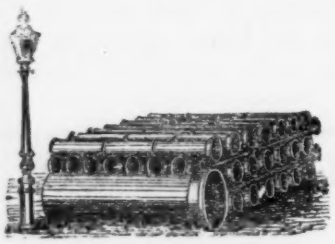

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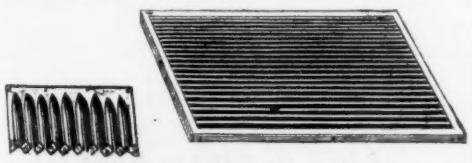

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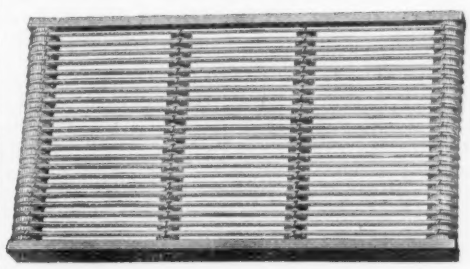

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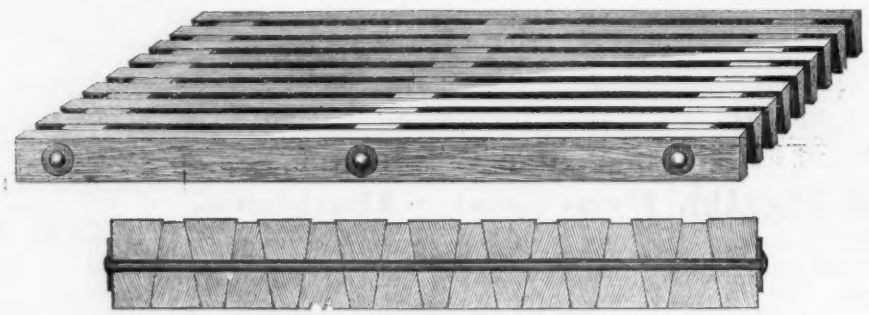

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